BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

In the Matter of the Commission, on its own motion, seeking to investigate whether the zones established in Docket No. C-2516 are appropriate in light of NUSF-26 findings and conclusions.	)))))	Application No. C-3554/PI-112

COMMENTS OF ALLO COMMUNICATIONS, LLC, MOBIUS COMMUNICATIONS COMPANY, AND PINPOINT COMMUNICATIONS, INC.

I.

INTRODUCTION

On February 28, 2006, the Nebraska Public Service Commission ("Commission") entered its Order Opening Docket in the above-captioned matter ("Opening Order") pursuant to which, among other matters, the Commission sought comment on the Commission Staff's proposed "Unifying Method" for reestablishing geographic cost zones and rates for unbundled element network loops ("UNE-Loops") in the State of Nebraska. Allo Communications, LLC, Mobius Communications Company and Pinpoint Communications, Inc.[1] ("Rural CETC's") hereby submit their joint comments on the issues set forth by the Commission in the Opening Order.

[1]Allo Communications, LLC was granted authority to operate as a local exchange carrier pursuant to Commission Order in Application No. C-2844, entered January 7, 2003. Mobius Communications Company received authority to provide competitive local exchange telecommunications services by Commission Order entered August 7, 2001 in Application No. C-2551. Pinpoint Communications, Inc.'s authority to operate as a competitive local exchange carrier was granted pursuant to the Commission's Order in Application No. C-2355, entered September 19, 2000.

II.

COMMENTS

A. Does the Commission have the Requisite Authority to Create More than the Three Zones Implemented in C-2516?

The Unifying Method proposed by the Commission in the Opening Order contemplates three in-town zones and three out-of-town zones rather than the three basic zones established in C-2516.[2] As stated in the Opening Order, the Federal Communications Commission ("FCC") promulgated regulations granting to State commissions the authority to establish different rates for elements in at least three defined geographic areas within the state to reflect geographic cost differences (the "FCC Rules").[3] This direct FCC authority has been utilized by commissions in all 50 states to establish defined zones within their respective states to reflect geographic cost differences, and at least 10 states have established more than three such cost-related rate zones.[4]

Evidence relating to authority for the establishment of more than three geographic cost-zones was presented by Dr. David I. Rosenbaum, an economic consultant to the Commission, in Dr. Rosenbaum's Direct Testimony in C-2516 filed on July 20, 2001.[5] Dr. Rosenbaum recommended to the Commission a methodology for use in calculating deaveraged UNE-Loop rates for Qwest Corporation, which involved collecting wire centers into groups based on similarities in their UNE-Loop costs, and then allocating the wire center groups into geographic

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[2] *In the Matter of the Commission, on its own motion, to investigate cost studies to establish Qwest Corporation's rates for interconnection, unbundled network elements, transport and termination, and resale*, Application No. C-2516/PI-49 ("C-2516"), Findings and Conclusions (April 23, 2002) and Compliance Filing Approved in Part and Denied in Part & Other Rates Declared Effective (June 5, 2002).
[3] See Opening Order, p.1; see also, 47 C.F.R. 54-51.507(f) and (f)(2).
[4] See Exhibit A hereto, "Unbundled Network Element Rate Comparison Matrix," Table 1 from A Survey of Unbundled Network Element Prices in the United States (Updated July 1, 2002), by Billy Jack Gregg, Director, Consumer Advocate Division, Public Service Commission of West Virginia, available online at http://www.cad.state.wv.us/Intro%20to%20Matrix.htm.
[5] Direct Testimony, David I. Rosenbaum, Ph.D., With Regards to Deaveraged UNE Loop Prices, dated August 8, 2001, Filed July 20, 2001, pgs. 7-10.

zones reflecting similar UNE-Loop cost characteristics.[6] Dr. Rosenbaum initially allocated wire centers into four zones which he concluded promoted efficient competition without creating burdensome administrative difficulties and unnecessary confusion to consumers.[7] Dr. Rosenbaum then provided the Commission the following testimony:

> Q. Does the FCC require creation of a certain number of zones?
>
> A. No. The FCC calls for deaveraging loop prices into "a minimum of three cost-related zones." It neither condones nor condemns the use of four zones.
>
> Q. Do other states use more than three zones?
>
> A. Yes.
>
> Q. Do other states use a method similar to the one you propose?
>
> A. Other states use a variety of methods and models. A limited sample of states reveals that at least two, Utah and Washington, use a similar method.
>
> Q. How do the proposed rates compare to rates in other states?
>
> A. Table 2 shows UNE prices by zones for a variety of different states and carriers. This table shows rates in many more states than it was possible to obtain information from about the process used to calculate UNE loop prices. The zone 1 price proposed here is lower than the price in some states and higher than in others. It is difficult to compare exactly as the company footprints vary across states.[8]

Table 2 identified in Dr. Rosenbaum's Direct Testimony is attached hereto as Exhibit B.

From a state law perspective, the Rules of Commission Procedure, Neb. Admin. Reg. Title 291, Chapter 1, Sections 003.01(5) and 012.01, permit the Commission to initiate a petition for investigation, on its own motion, to investigate issues of concern to the Commission. That authority was utilized by the Commission in opening this Docket to investigate "whether the

[6]See Rosenbaum Direct Testimony, pgs. 6 and 7.
[7]See Rosenbaum Direct Testimony, pgs. 8 and 9.
[8]See Rosenbaum Direct Testimony, p. 9, lines 17-22; p. 10, lines 2-11.

zones established in Docket C-2516 are appropriate in light of NUSF-26 findings and conclusions."

Further, pursuant to Neb. Rev. Stat. § 86-122, the Commission is directed to implement the Federal Telecommunications Act of 1996 ("Act"), which authority is to be broadly construed in a manner consistent with the Act. Therefore, action taken by the Commission to implement the FCC Rules promulgated in accordance with the Act, including the creation of three or more cost-related zones for the establishment of density-related pricing plans for unbundled network elements, including UNE-Loops, is clearly within the authority of this Commission.

B. Is the Unifying Method Proposed by the Commission a Sound Methodology or Should it be Modified or Changed?

The Rural CETC's support the Commission's Unifying Method and believe that the approach embodied in the Unifying Method marries the theories of the original zone-based rate calculations adopted in C-2516 with the new methodology for calculating universal service support adopted in the Commission's Findings and Conclusions in NUSF-26, entered November 3, 2004 (the "NUSF-26 Order"). The Commission's findings in the NUSF-26 Order were based on the principle that average loop cost is a function of population density – the higher the density, the lower the loop cost.[9] Further, the Commission found that businesses are typically located in more dense areas, with lower loop costs.[10] The support areas within each wire center developed by the Commission under the Support Allocation Methodology adopted in the NUSF-26 Order utilized census blocks aggregated by "in town" areas and "out of town" areas. The population densities of each of such areas were then determined in order to calculate

[9]NUSF-26 Order, ¶ 58.
[10]NUSF-26 Order, ¶ 35.

expected loop costs in each support area. The Commission concluded that the expected loop cost was a function of density, with the loop cost declining steeply as density increases.[11]

The Commission's Unifying Method embraces the more granular analysis of loop costs established in the NUSF-26 Order and reallocates the loop costs and rates between "in town" lines and "out of town" lines to reflect the true cost of loops in those geographic locales. The Unifying Method does not require, nor would the Rural CETC's support, a new cost docket to redetermine costs and rates for network elements. The simple reallocation of costs and rates to similar zones utilized in the Unifying Method accomplishes the balance needed to reconcile the findings set forth in C-2516 and the NUSF-26 Order.

By adopting the Unifying Method, the incumbent providers and the Rural CETC's will be in substantially the same position when looking at total lines across the state. The Unifying Method will result in greater competition throughout the state through the use of UNE-Loops. Incumbent providers and CLEC's, including the Rural CETC's, will be equally impacted by the support adjustments.

C. Would an Alternative Methodology or Methodologies be Preferable to the Staff's Proposals?

The Rural CETC's believe that the Commission's proposed Unifying Method will substantially correct the disparity between the Commission's findings in C-2516 and the NUSF-26 Order and will once again promote investment and foster an economic environment conducive to effective competition across all regions and classes of customers.

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[11]NUSF-26 Order (Appendix A), pgs. 6 and 7; see also, Exhibit C hereto, Tyler E. Frost and David I. Rosenbaum, "Recommendation for a Permanent Universal Service Support Mechanism," The Natural Regulatory Research Institute, Volume 3, December 2005, p. 35, available online at http://www.nrri.ohio-state.edu/dspace/bitstream/2068/924/16/05-17+JAR+Vol+3.pdf.

III.

CONCLUSION

The Rural CETC's respectfully request the Commission to adopt the Unifying Method proposed by the Commission's Staff in order to establish a fair and equitable mechanism for allocating universal service funds.

Respectfully submitted this 3rd day of May, 2006.

ALLO COMMUNICATIONS, LLC, MOBIUS
COMMUNICATIONS COMPANY, AND
PINPOINT COMMUNICATIONS, INC.

By____________________________________

Loel P. Brooks, #15352
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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on this 3rd day of May, 2006, an original and five copies of the foregoing Comments of Allo Communications, LLC, Mobius Communications Company, and Pinpoint Communications, Inc. were hand-delivered and sent electronically to:

Andrew S. Pollock
Executive Director
Nebraska Public Service Commission
1200 "N" Street, Suite 300
Lincoln, NE 68509-4927

____

Loel P. Brooks

Exhibit A

Exhibit B

Exhibit C

Exhibit A

UNBUNDLED NETWORK ELEMENT RATE COMPARISON MATRIX

All Rates for RBOC in each State Unless Otherwise Noted
Updated July 2002

State Access Lines	Company	Density Zones	Loop Rate (per Month)	Port Rate (per Month)	Switching (per MOU)	Tandem Switching and Transport (per MOU)
Alabama	BS	1 2 3	$15.24 $24.75 $44.85	$2.07	$0.0017	$0.0008 Tandem Switching $0.00045 Common Transport
2,008,385		Avg	$19.04			
Alaska	ATU	1	$14.92	$4.27	$0.006595	$0.004712 Tandem Switching $0.000416 Termination
183,484						
	ACS	1	$19.19	$1.38	$0.00203	$0.00155 Tandem Switching $0.00023 Common Transport
42,811						
Arizona	QW	1 2 3	$18.96 $34.94 $56.53	$1.61	$0.0028	$0.0014 Tandem Switching $0.00088 Common Transport
2,932,068		Avg	$21.98			
Arkansas	SBC	3 2 1	$11.86 $13.64 $23.34	$1.61	$0.001310 $0.001690 $0.002530	$0.000789 Tandem Switching $0.000157-$0.000196 plus per mile Common Transport
1,069,214		Avg	$13.09		$0.001843	
California	SBC	1 2 3	$8.83 $11.27 $19.63	$0.88	$0.001817 set up $0.000563 Originating $0.002142 set up $0.000573 Terminating	$0.000234 set up $0.000139 Tandem Switching $0.00133 Common Transport
18,755,730		Avg	$9.93			
Colorado	QW	1 2 3	$5.91 $12.31 $32.79	$1.86 $1.48*	$0.00200	$0.002007 Tandem Switching $0.00131 Common Transport
2,867,692		Avg	$15.85			
Connecticut	SBC	1A B C D	$8.95 $12.03 $13.28 $19.69	$3.31	$0.007151**	$0.001984 Tandem Switching
2,527,459		Avg	$12.49			

*Port rate doesn't include vertical features.
** On-NET Rate, includes shared transport.

State Access Lines	Company	Density Zones	Loop Rate (per Month)	Port Rate (per Month)	Switching (per MOU)	Tandem Switching and Transport (per MOU)
D.C. 924,593	VZ	1	$10.81	$1.55	$0.003	$0.001043 Tandem Switching $0.00015 Common Transport
Delaware 598,874	VZ	1 2 3 Avg	$10.07 $13.13 $16.67 $12.05	$2.23	$0.003634 Originating $0.001927 Terminating	$0.0006688 Tandem Switching $0.0001221 Common Transport
Florida 6,798,389	BS	1 2 3 Avg	$12.79 $17.27 $33.36 $15.81	$1.40	$0.0007662	$0.0001319 Tandem Switching $0.0004372 Common Transport
Georgia 4,376,539	BS	1 2 3 Avg	$14.21 $16.41 $26.08 $16.51	$1.85	$0.001633	$0.0006757 Tandem Switching $0.0002126 Common Transport
Hawaii 722,977	VZ	Oahu Maui Hawaii	$10.44 $17.23 $21.91	$2.69	$0.0076074	$0.0012572 Tandem Switching $0.0002710 Common Transport
Idaho 561,707	QW	1 2 3 Avg	$15.81 $24.01 $40.92 $20.42	$1.34	$0.001733	$0.00069 Tandem Switching $0.00111 Common Transport
Illinois 6,953,854	SBC	1A 1B 1C 2C Avg	$2.59 $7.07 $11.40 $11.40 $9.81	$5.01 Port rate includes unlimited switching	n/a	$0.000215 Tandem Switching $0.000809 Common Transport
Indiana 2,285,207	SBC	3 2 1 Avg	$8.03 $8.15 $8.99 $8.20	$5.34	$0.003444	$0.000307 Tandem Switching $0.00066 Common Transport
Iowa 1,122,068	QW	1 2 3 Avg	$13.11 $15.64 $27.27 $16.47	$1.15	$0.00069	$0.00069 Tandem Switching $0.00111 Common Transport

Table 1

State Access Lines	Company	Density Zones	Loop Rate (per Month)	Port Rate (per Month)	Switching (per MOU)	Tandem Switching and Transport (per MOU)
Kansas 1,454,785	SBC	3 2 1 Avg	$11.86 $13.64 $23.34 $14.04	$1.61	$0.00131 $0.00169 $0.00253	$0.000789 Tandem Switching $0.000401-$0.000475 Blended Transport
Kentucky 1,258,957	BS	1 2 3 Avg	$10.56 $15.34 $31.11 $18.41	$1.49	$0.001197	$0.000194 Tandem Switching $0.0007466 Common Transport
Louisiana 2,418,203	BS	1 2 3 Avg	$14.05 $24.14 $49.30 $17.31	$2.55	$0.0021	$0.0008 Tandem Switching $0.00047 Common Transport
Maine 724,630	VZ	1 2 3 Avg	$11.44 $13.47 $18.75 $16.19	$0.94	$0.00168	$0.001221 Tandem Switching $0.001094 Day $0.000322 Evening $0.0000 Night & W/end Common Transport
Maryland 3,924,291	VZ	A1 A2 B1 B2 Avg	$12.11 $12.85 $25.96 $18.40 $14.50	$1.90	$0.0038	$0.000695 Tandem Switching $0.000353 Common Transport
Massachusetts 4,527,199	VZ	1 2 3 4 Avg	$7.54 $14.11 $16.12 $20.04 $14.98	$2.00	$0.004647-$0.001872 $0.004724-$0.001872	$0.00119 -$0.000851 Tandem Switching $0.002201-$0.000489 Common Transport
Michigan 5,436,051	SBC	A B C Avg	$8.47 $8.73 $12.54 $10.15	$2.53	$0.001192	$0.001058 Tandem Switching $0.000446 Common Transport
Minnesota 2,354,431	QW	1 2 3 4 Avg	$8.81 $12.33 $14.48 $21.91 $17.87	$1.08	$0.00181	$0.00134 Tandem Switching $0.001484 Common Transport
Mississippi 1,356,519	BS	1 2 3 4 Avg	$15.58 $20.65 $29.51 $38.94 $21.26	$2.11	$0.0023771	$0.0007834 Tandem Switching $0.0004281 Common Transport

State Access Lines	Company	Density Zones	Loop Rate (per Month)	Port Rate (per Month)	Switching (per MOU)	Tandem Switching and Transport (per MOU)
Missouri	SBC	1	$12.71	$1.74	$0.001620	$0.001231
		2	$18.64	$1.97	$0.001949	Tandem Switching
		3	$19.74	$2.47	$0.002807	$0.000507-$0.000697
		4	$16.41	$2.25	$0.002391	Blended Transport
2,749,726		Avg	$15.19	$1.89		
Montana	QW	1	$23.10	$1.58	$0.00069	$0.000690
		2	$23.90			Tandem Switching
		3	$27.13			$0.001110
		4	$29.29			Common Transport
381,611		Avg	$23.72			
Nebraska	QW	1	$15.14	$2.47	$0.00069	$0.00069
		2	$35.05			Tandem Switching
		3	$77.92			$0.001110
						Common Transport
510,773		Avg	$17.51			
Nevada	SBC	1	$11.75	$1.63	$0.00161	$0.00171
		2	$22.66			Tandem Swtiching
		3	$66.31			$0.00727
						Common Transport
389,199		Avg	$19.83			
New Hampshire	VZ	1	$14.01	$2.51	$0.010697-$0.003888	$0.001589-$0.001386
		2	$15.87	$2.20		Tandem Switching
		3	$24.09	$2.21		$0.001001-$0.0000
						Common Transport
801,344		Avg	$17.99	$2.22		
New Jersey	VZ	1	$8.12	$0.73	$0.002773	$0.000674
		2	$9.59		Originating	Tandem Switching
		3	$10.92		$0.002508	$0.000085 & $0.0000006 per mile
					Terminating	Common Transport
6,692,681		Avg	$9.52			
New Mexico	QW	1	$17.75	$1.38	$0.0011083	$0.001616
		2	$20.30			Tandem Switching
		3	$26.23			$0.001882
860,898		Avg	$20.50			Common Transport
New York	VZ	1	$7.70	$2.57*	$0.00115	$0.000481
		2	$11.31		Originating	Tandem Switching
		3	$15.51	*$4.57 standalone	$0.00111	$0.000939
					Terminating	Common Transport
11,869,385		Avg	$11.49			
North Carolina	BS	1	$12.11	$2.19	$0.0017	$0.0009
		2	$21.24			Tandem Switching
		3	$33.65			$0.00034
2,594,816		Avg	$15.88			Common Transport

State Access Lines	Company	Density Zones	Loop Rate (per Month)	Port Rate (per Month)	Switching (per MOU)	Tandem Switching and Transport (per MOU)
North Dakota	QW	1 2 3	$14.78 $24.92 $56.44	$1.27	$0.00069	$0.00069 Tandem Switching $0.001110 Common Transport
215,193		Avg	$17.79			
Ohio	SBC	B C D	$5.93 $7.97 $9.52	$4.63	$0.003226	$0.000689 Tandem Switching
4,103,686		Avg	$7.01			
Oklahoma	SBC	3 2 1	$12.14 $13.65 $26.25	$2.18 $2.21 $2.58	$0.002268 $0.002516 $0.0038	$0.000956 Tandem Switching $0.000607-$0.000972 Blended Transport
1,737,875		Avg	$14.84	$2.25		
Oregon	QW	1 2 3	$13.95 $25.20 $56.21	$1.26	$0.001330	$0.001596 Tandem Switching $0.001273 Common Transport
1,451,229		Avg	$15.00			
Pennsylvania	VZ	1 2 3 4	$10.25 $11.00 $14.00 $16.75	Option A: $2.67 Option B:*** $1.90	$0.001802 Originating $0.001615 Terminating	$0.000795 Tandem Switching $0.000144 & $0.000003/mile Common Transport
6,395,835		Avg	$13.81			
Rhode Island	VZ	1 2 3	$11.19 $15.44 $19.13	$1.86	$0.001358 Originating $0.001192 Terminating	$0.001418 Tandem Switching $0.001050 Common Transport
660,645		Avg	$13.93			
South Carolina	BS	1 2 3	$14.94 $21.39 $26.72	$1.65 w/all features $3.04	$0.0010519	$0.0001634 Tandem Switching $0.0004095 Common Transport
1,528,085		Avg	$17.60			
South Dakota	QW	1 2 3	$17.01 $18.54 $24.37	$1.84	$0.003469	$0.001748 Tandem Switching $0.001388 Common Transport
276,180		Avg	$21.09			
Tennessee	BS	1 2 3	$13.19 $17.23 $22.53	$1.89	$0.0008041	$0.0009778 Tandem Switching $0.00038 Common Transport
2,754,858		Avg	$14.92			

*** Option A includes all vertical features. Option B includes all vertical features except 3-way calling.

State Access Lines	Company	Density Zones	Loop Rate (per Month)	Port Rate (per Month)	Switching (per MOU)	Tandem Switching and Transport (per MOU)
Texas	SBC	3 2 1	$12.14 $13.65 $18.98	$1.58 $2.47 $4.21	$0.002116	$0.000794 Tandem Switching $0.000123-$0.000144 Common Transport
10,369,492		Avg	$14.15	$2.90		
Utah	QW	1 2 3	$14.77 $17.76 $20.29	$0.89 $0.90 $1.02	$0.002299 $0.002664 $0.002896	$0.001025-$0.001059 Tandem Switching $0.001111 Common Transport
1,152,656		Avg	$16.13	$0.92	$0.002491	
Vermont	VZ	1 2 3	$7.72 $8.35 $21.63	$1.03	$0.004003	$0.000921 Tandem Switching $0.000630 Common Transport
360,411		Avg	$14.41			
Virginia	VZ	1 2 3	$10.74 $16.45 $29.40	$1.30	$0.004129 Originating $0.002079 Terminating	$0.000548 Tandem Switching $0.000114 Common Transport
3,681,236		Avg	$13.597			
Washington	QW	1 2 3 4 5	$6.41 $11.35 $12.76 $14.31 $19.06	$1.34	$0.0012	$0.00141 Tandem Switching $0.001219 Common Transport
2,587,662		Avg	$14.56			
West Virginia	VZ	1 2 3	$14.99 $22.04 $43.44	$1.60	$0.008868 Originating $0.005622 Terminating	$0.0002394 Tandem Switching $0.00067 Common Transport
871,569		Avg	$24.58			
Wisconsin	SBC	1	$10.90	$3.71	$0.003451	$0.000674 Tandem Switching $0.001072 Common Transport
2,186,698						
Wyoming	QW	BRA 1 2 3	$19.91 $26.94 $30.13 $40.98	$2.64	$0.003685	$0.003225 Tandem Switching $0.001792 Common Transport
258,704		Avg	$23.39			

Note: Access line data from NECA USF submission to FCC, dated October 1, 2001.

Exhibit B

TABLE 2

UNE LOOP RATES IN OTHER STATES

		ZONES			
STATE	COMPANY	1	2	3	4
Alabama	BS	$15.24	$24.75	$44.85	
Arkansas	SBC	18.75	31.60	71.05	
Colorado	Qwest	19.65	26.65	38.65	84.65
Connecticut	SBC	8.95	12.03	13.28	19.69
Delaware	VZ	10.07	13.13	16.67	
Florida	BS	13.76	20.13	44.40	
Georgia	BS	14.21	16.41	26.08	
Indiana	AIT	8.03	8.15	8.99	
Kansas	SBC	11.86	13.64	23.34	
Kentucky	VZ	17.44	22.23	25.84	
Kentucky	BS	13.54	19.73	28.27	
Minnesota	Qwest	8.81	12.33	14.48	21.91
Missouri	SBC	12.71	20.71	33.29	18.23
Montana	Qwest	26.69	27.62	31.36	33.95
Nevada	SBC	11.75	22.66	66.31	
New Mexico	Qwest	17.75	20.30	26.23	
North Dakota	Qwest	16.41	27.66	62.66	
Oklahoma	SBC	12.14	13.65	26.25	
Oregon	Qwest	13.95	25.20	56.21	
South Dakota	Qwest	7.01	18.54	24.37	
Texas	SBC	12.14	13.65	18.98	
Utah	Qwest	14.41	17.47	24.14	
Wyoming	Qwest	19.05	31.83	40.11	58.43
NEBRASKA	Qwest	13.58	20.93	35.05	69.96

Exhibit C

RECOMMENDATIONS FOR A PERMANENT UNIVERSAL SERVICE SUPPORT MECHANISM

Tyler E. Frost and David I. Rosenbaum*

Introduction

Universal service is the obligation to provide affordable telephone access to all persons, regardless of geography or demography. Historically, incumbent local exchange carriers (ILECs) fulfilled their universal service obligations by employing a rate structure with cross-subsidy pricing. ILECs kept local residential telephone rates affordable using as subsidies revenues generated from other services and customer classes. These practices continued well into the 1990s.

The Telecommunications Act of 1996 changed the regulatory environment significantly: Competition was introduced into the previously monopolistic local exchange environment. Local residential service rates could no longer be priced below cost. Universal service obligations would have to be met another way. Cross subsidies were to be removed and support made explicit. In high-cost, rural areas, these changes potentially meant significant price increases and the disappearance of residential customers from the public switched telephone network.
The Federal Communications Commission (FCC) and individual state commissions were charged with developing explicit universal service mechanisms. These were intended to provide affordable local service to customers in high-cost areas and further the already established universal service obligations. The FCC developed a federal universal service mechanism to recover the interstate costs of local service. This left states with the task of developing mechanisms to recover the remaining costs.

This paper develops an efficient, reasonable, independently verifiable methodology to allocate support amounts necessary to fulfill a state's universal service obligations. The methodology is applied to Nebraska, but the underlying models and data are available to make it applicable in any state. Hence, it provides a guide for other state commissions to consider in their own quests to support universal service.

The process assumes that a state has already determined the aggregate amount of support it will distribute through a universal service process. The methodology then uses a relative costing mechanism to allocate that fund across high-cost areas within the state. This separation of fund size from fund allocation gives policy makers flexibility in determining the overall amount of support to provide without creating distortions in allocation.

*Tyler E. Frost is an economist with the Nebraska Public Service Commission; David L. Rosenbaum is a professor of economics at the University of Nebraska.

In essence, the methodology divides a state into support areas and compares estimated loop cost in each area to a rate affordability benchmark. Areas with costs below the affordability benchmark receive no support. Areas with costs above the affordability benchmark receive a share of the universal service fund. Each area's share is determined by its need for support relative to need aggregated across the state. Thus, areas where service is provided to many high-cost households receive a relatively large allocation of the fund. Areas with few high-cost households—or with households that have only moderate costs—receive a relatively small allocation of the fund.

In high-cost areas, loop costs make up a substantial proportion of a firm's cost of service. Therefore, loop cost forms the basis for allocating the fund. The next section of this paper starts with a description of the loop. It then goes on to describe the proposed methodology for states to support universal service. The third section describes the support methodology in detail. It breaks the methodology into three tasks, containing a total of 12 steps. Each task and its associated steps are described in their own subsection. The results of the methodology, as applied to Nebraska, are discussed in the fourth section. This is followed by a conclusion.

The Local Loop

The main portion of the path over which the voice signal is carried to the called party is the "local loop." The local loop is an essential element in the local telephone network. The loop represents the final network element needed to make connection with the end-user customer and, thus, is vital to the success of universal service and its goals.

The loop physically extends from a local exchange switch, housed in a central office, to the customer's premises, a home, business, apartment building, etc. Representations of the loop and the exchange are shown in Figure 1. The loop is made up of feeder and distribution elements, commonly referred to as "subloop" elements. The feeder, generally fiber, extends from the local exchange switch to various points within the network, where the feeder is connected to the distribution portion of the local loop, historically consisting of copper cables. The distribution portion of the loop extends to the customer premises, with the demarcation point, or network interface device (NID), completing the "last mile."

As the local loop path makes its way towards the central office, several distribution cables consolidate into the feeder portion of the local loop to allow for more efficient transport of voice traffic. The feeder cable then extends to the central office, terminating on the central office's voice switch via a main distribution frame (MDF). A call terminating within the same central office will traverse a path, similar to that described above, in reverse, over the called party's local loop path.

In high-cost areas, the loop makes up a significant proportion of the total cost of providing local exchange service. Hence, allocating universal service support will be a function of loop costs. Areas with relatively high loop costs will inevitably be high-cost areas needing support. Areas with low loop costs will be unlikely to need support. Consequently, determining loop costs will be inexorably intertwined with any universal service fund allocation method.

In its pricing rules, the FCC determined rates established according to its forward-looking economic cost (FLEC)-based methodology, which is defined as total element long run incremental cost (TELRIC), to be just, reasonable, and nondiscriminatory.[1] The FCC's forward-looking cost method is a practical variant of the marginal cost principal. Thus, rates set via a TELRIC-compliant method are forward-looking in nature and are fair and efficient, resulting in an environment that allows consumers to make the best buying choices.[2]

The Methodology

Overview

The Nebraska Universal Service Fund (NUSF) Support Allocation Methodology (SAM) presented here, provides a reasonable process to allocate the finite amount of support available to those Nebraska Eligible Telecommunications Carriers (NETCs) providing service to high-cost areas.[3] The SAM takes a dualistic approach. First, the Nebraska Public Service Commission (NPSC) determines the aggregate amount of funds to be allocated in support of universal service. Then, the SAM is used to allocate those funds. Approaching the allocation issue separate from the sizing of the NUSF allows the NPSC to adjust funds available for universal service support, as necessary, without affecting each NETC's relative share of the NUSF. This results in a practical, manageable, and flexible NUSF that focuses support to high-cost areas in the state.

Allocation Method

The actual allocation method has twelve steps divided into three major tasks as outlined below. First, a forward-looking cost model is used to relate household density to average loop cost. Once this relationship is established, the next task divides the state into support areas and uses regression results to link measured density in each support area to expected loop cost. Finally, relative allocations are determined.

The first major task estimates expected loop cost as a function of density. This task requires four steps:

1. Using a forward-looking cost model to estimate loop costs throughout the state
2. Using the model results to divide the state into density-based areas
3. Measuring the average household density and average loop cost in each area as indicated by the cost model.
4. Using regression analysis to relate average loop cost to density based on the observed areas

The second task divides the state into support areas and uses the regression results from step four to link measured density to expected loop cost in each support area. The associated steps are:

5. Dividing the state into multiple "town" and "out of town" support areas based on Census data
6. Using the Census data to measure household density in each area
7. Using the regression results to estimate the expected average loop cost in each support area

Finally, relative allocations are determined. This involves:

8. Developing a rate affordability benchmark for each operating company
9. Comparing the expected average loop cost in each support area to the benchmark. If the benchmark is higher than the average expected loop cost, that area gets no support. If the benchmark is below the average expected loop cost, then the

difference, multiplied by the number of households in the area, becomes that area's "base" support amount.

10. Aggregating the "base" support amounts to get the state's total support amount
11. Determining each area's share of the NUSF based on its base support amount relative to the state's aggregate support amount
12. Aggregating area support amounts to the company level

Linking FLEC to Density

The first step in the SAM is to calculate forward looking costs on a statewide basis. The SAM utilizes version 3.1 of the Benchmark Cost Proxy Model (BCPM) for this purpose.[4] The NPSC reviewed version 3.1 of the BCPM when making a recommendation to the FCC regarding model choice for federal universal service support. After thorough analysis bolstered by numerous hearings and comment periods, the NPSC selected BCPM as the more desirable model for that purpose.[5]

The second step is to divide the state into density-based areas.[6] The separation is done on a company-by-company basis. The end result is a data file containing information related to each density zone, for each wire center, for every NETC.[7]

Once information is gathered at the density zone level, it is used to calculate the zone's average density and monthly loop cost. This is the third step in the SAM. Density is calculated as the aggregate number of households in the zone divided by the zone's total square mile area. To calculate each zone's average loop cost, investments in each loop equipment-related asset class are converted into annual expense and maintenance costs.[8] To accomplish this conversion, annual cost factors are applied to investment amounts in each of the various equipment classes. Annual cost factors are then applied to support equipment to get support equipment expenses and maintenance costs.[9] Eighty-six percent of the support equipment expense and maintenance cost is allocated to the loop; the rest is allocated to switching, interoffice transport, and other non-loop related services.[10]

The annual expense and maintenance costs associated with equipment and support assets are aggregated to obtain zone-wide annual costs. To calculate an annual per-line loop costs, zone-wide annual costs are divided by the number of lines served. Finally, the annual per-line loop cost is divided by 12 to arrive at a monthly per-line loop cost—the monthly per-line cost to meet the service needs in a particular area.

The fourth step in the process models forward-looking loop cost as a function of household density in each of the BCPM density zones. Regression analysis is used to relate loop cost to household density. Letting $LoopCost_i$ represent the loop cost in area i, and $HouseHoldDensity_i$ represent household density in area i, the functional relationship between the two generally can be described as:

$$LoopCost_i = \alpha\, e^{-\beta * HouseHoldDensity_i} \qquad (1)$$

This functional form allows loop cost to decrease at a decreasing rate as household density increases. Taking natural logarithms of each side, Equation (1) becomes:

$$Ln(LoopCost_i) = \gamma - \beta * HouseHoldDensity_i \qquad (2)$$

where $Ln(\bullet)$ is the natural log operator and $\gamma = Ln(\alpha)$.

The specification in Equation (2) forces one curve through all of the observations in the sample. However, a visual examination of the data seems to indicate that observations for moderately dense areas may lie on different curves than observations for less dense or very dense areas. Therefore, three dummy variables are created that take values of one when density falls within certain boundaries and are zero otherwise. Let $\overline{D^{Low\text{-}Middle}}$ respresent and threshold between the low- and the middle-density areas. Similarly, let $\overline{D^{Middle\text{-}High}}$ represent the threshold between the middle-and the high-density areas. The following dummy variables are created:

$$D_i^{Low} = \begin{cases} 1 \text{ if } HouseHoldDensity_i \leq \overline{D^{Low\text{-}Middle}} \\ 0 \text{ Otherwise} \end{cases} \quad \text{(3A)}$$

$$D_i^{Middle} = \begin{cases} 1 \text{ if } \overline{D^{Low\text{-}Middle}} < HouseHoldDensity_i \leq \overline{D^{Middle\text{-}High}} \\ 0 \text{ Otherwise} \end{cases} \quad \text{(3B)}$$

$$D_i^{High} = \begin{cases} 1 \text{ if } HouseHoldDensity_i > \overline{D^{Middle\text{-}High}} \\ 0 \text{ Otherwise} \end{cases} \quad \text{(3C)}$$

Using these dummy variables, Equation (2) is re-specified as:

$$\begin{aligned} Ln(LoopCost_i) = {} & D_i^{Low} (\gamma_L - \beta_L * HouseHoldDensity_i) \\ & + D_i^{Middle} (\gamma_M - \beta_M * HouseHoldDensity_i) \\ & + D_i^{High} (\gamma_H - \beta_H * HouseHoldDensity_i) \end{aligned} \quad (4)$$

For relatively sparsely populated areas, the intercept is γ_L and the slope is β_L. For medium-density areas, the intercept is γ_M and the slope is β_M. For high-density areas, the intercept is γ_H and the slope is β_H. The optimal values for $\overline{D^{Low\text{-}Middle}}$ and $\overline{D^{Middle\text{-}High}}$ are found endogenously as the values that maximize the log likelihood function derived from estimation.

Equation (4) was estimated using linear least squares.[11] Initial statistical tests indicated the error terms generated from estimating Equation (4) may be heteroscedastic. Heteroscedasticity occurs when the disturbance variances are not constant across observations. When this occurs, the values of the least squares coefficient estimates are unbiased,[12] but the variances associated with those coefficient estimates are biased.[13] Statistical methods were used to correct for heteroscedasticity, leaving the parameter estimates in Equation (4) unchanged, but improving the estimated standard errors.

As the dataset sample size seems adequate to accommodate the option, the White Heteroskedasticity Consistent Covariance Matrix estimation[14] was used to correct, in the limit, the standard errors initially developed using linear least squares. After correcting for heteroscedasticity, all six coefficient estimates in Equation (4) have t-statistics indicating that they are statistically different than zero at the 99-percent confidence level. The Equation has an R^2 of 0.95, indicating that 95 percent of the variation in the natural log of loop cost can be explained by variation in density. Given the statistical significance of the coefficients, it is valid to conclude that Equation (4) fits the data better than Equation (2). Full results are listed in Table 1.

This piece-wise regression, using three curved segments, explains loop cost as a function of density. The critical lower and upper density levels, 4.5 and 34 households per square mile, respectively, are determined as the values that maximize the log likelihood function derived from estimation.[15] The first curved segment indicates that loop cost declines rather steeply as density increases from near zero to the first critical point of 4.5 households per square mile. The second curved segment indicates that loop cost declines more moderately as density increases beyond the first critical point up

TABLE 1
TOTAL LOOP COST/DENSITY REGRESSION RESULTS

Parameter	Estimated Value (std. error)
γ_L	6.4048* (0.3487E-01)
γ_M	4.3937* (0.3475E-01)
γ_H	3.0198* (0.1748E-01)
β_L	-0.51197* (0.1915E-01)
β_M	-0.040666* (0.2016E-02)
β_H	-0.00026585* (0.2025E-04)
R^2	0.9526
No. of Obs.	1240

Source: Author's construct.

*Statistically significant at 99 percent significance level using two-tailed t test.

to the second critical point of 34 households per square mile. The third curved segment indicates that loop cost declines relatively modestly as density increases beyond 34 households per square mile.

In areas below or equal to 4.5 households per square mile, expected loop cost as a function of density is:

$$E\{Ln(LoopCost_i)\} = 6.4048 - 0.51197 * HouseHoldDensity_i \quad (5)$$

or, taking the exponential of both sides of Equation (5),

$$E\{LoopCost_i\} = 604.74e^{-0.51197 * HouseHoldDensity_i} \quad (6)$$

In areas with household density above 4.5 but below or equal to 34 households per square mile, expected loop cost as a function of density is:

$$E\{LoopCost_i\} = 80.94e^{-0.040666 * HouseHoldDensity_i} \quad 7)$$

In areas where there are greater than 34 households per square mile, the expected loop cost as a function of density is:

$$E\{LoopCost_i\} = 20.49e^{-0.00026585 * HouseHoldDensity_i} \quad (8)$$

Creating Support Areas and Estimating Loop Costs

The next major task in the SAM is to create support areas and determine the expected loop cost in each area. Support areas are created so that NUSF can be directed toward relatively high-cost areas within the state. The areas are density-based since there is strong support for cost being an inverse function of density.[16]

In step five, multiple support areas are created using the year 2000 census block data. Within each wire center, census blocks are aggregated into "town" areas and "out-of-town" areas to create the support areas utilized by the SAM. Town areas are identified as cities, villages, or unincorporated areas with 20 or more households and densities greater than 42 households per square mile. Out-of-town areas are the remainder of the census blocks in an exchange not assigned to a town.

Once support areas are created, step six calculates the household density in each support area. A household is defined as a housing unit—a house, an apartment or other group of rooms, or a single room, when occupied as separate living quarters with direct access from the outside or through a common hall.[17] Census block data is aggregated for each wire center's town and out-of-town support areas, as described above. Town and out-of-town densities are calculated as households divided by square miles. With the densities determined, step seven uses the regression results from Equations (6) through (8) to estimate the expected loop cost in each support area as a function of its density.

The Benchmark and Relative Allocations

To begin the third task in the SAM, step eight develops the rate affordability benchmark for each NETC. The NPSC adopted a $17.50 residential rate, not including surcharges, as a starting point in determining the benchmark.[18] The NPSC has the authority to raise or lower the starting point, as necessary, to further the goals of the Nebraska Telecommunications Universal Service Fund Act.[19] Several adjustments are applied to the basic benchmark of $17.50. These adjustments are Nebraska specific. However, states may make their own adjustments to the benchmark to reflect their specific needs and circumstances.

The first adjustment reflects the fact that loop costs are most but not all of the costs required to provide local service. The BCPM-generated loop cost represents about 86 percent of total cost.[20] Thus, components of local service such as switching, signaling, the NID, and other costs included in the benchmark must be removed prior to comparison to expected average loop cost. Consequently, the initial $17.50 benchmark is reduced to arrive at an amount reflective of loop cost only.

The second adjustment accounts for multiple access lines to dwellings. By using the Census household data, NUSF support is implicitly focused the primary residential line in each household in high-cost areas. However, the typical ILEC engineers its network to accommodate multiple access lines per household. Thus, the benchmark is adjusted to reflect the number of access lines per household. The SAM utilizes a value of 1.15 access lines per household for all Nebraska ILECs. The access lines per household factor is calculated as the total number of Nebraska residential access lines divided by the number of Nebraska households requesting service; households requesting service equals to the total number of Nebraska households multiplied by the percentage of Nebraska households with telephone service.[21]

Additional adjustments are made to the benchmark to account for legitimate revenue sources available to NETCs for recovering the cost of providing the local loop. The federal subscriber line charge (SLC), while differing by amount, is charged ubiquitously by all NETC's. An adder-adjustment is made to the residential loop benchmark to account for revenues recovered through the federal SLC.

Company-specific SLC rates are utilized and added to each company's SAM benchmark.

In its findings released Jan. 13, 1999, the NPSC determined services, such as access service, may not be priced at levels that support residential service. The rates for these services that provide implicit support were to be reduced.[22] However, reduction methods differed for rural and non-rural companies. Additionally, the initial access rates, prior to any reductions, differed significantly by company. Thus, the access rates that resulted from the NPSC's rate rebalancing edict differ by company. The Access Adder-Adjustment accounts for the differences due to differing access service rates in monthly revenues collected from an average residential line.[23]

The next adjustment accounts for zone rates. Various NETC's charge additional "zone" rates to the end-user. These "zone" rates are dependant on distance from a central office and recover additional revenue in support of the local loop. The Zone Adder-Adjustment accounts for monthly revenues collected by those companies utilizing zone adder charges. The Zone Adder-Adjustment is company specific in its application to the SAM benchmark.

Another adjustment is made for digital subscriber line (DSL) revenues. DSL technologies provide a method in which a customer is able to use the previously idle, high frequency portion of the copper local loop bandwidth. The provisioning of DSL allows providers to offer high-speed access to telecommunications and information services over the local loop.[24] An adder-adjustment is made to the residential loop benchmark to account for loop revenues recovered through the provisioning of DSL service offerings.

The availability of DSL to consumers in all areas of the state, the number of consumers choosing to purchase DSL services, and the amount DSL service contributes to recovery of local loop costs are all utilized in the calculation of the xDSL Adder-Adjustment. Utilizing a DSL availability value of 80 percent,[25] a DSL penetration value of 20 percent, and a DSL loop contribution value of $10, the xDSL Adder-Adjustment is calculated as $1.60 per household.[26] The xDSL Adder-Adjustment is not company specific.

In summary, the ultimate SAM benchmark is calculated as the company-specific product of the benchmark base and the loop cost versus total cost adjustment, plus any applicable Adder-Adjustments, adjusted by the Access Lines per Household factor. The Access Lines per Household adjustment is applied to the Adder-Adjustments to ensure these adjustments are also stated in terms of households. Company-specific adjustments to the benchmark base and resulting SAM benchmarks are listed in Table 2.

Relative Support Allocations

Step nine in the SAM compares each support area's benchmark to its expected loop cost. If a support area's expected loop cost is below the SAM benchmark, the support area's base support amount is zero. However, if a support area's expected loop cost is above the appropriate benchmark, the difference between the two is multiplied by the number of households in the support area to determine the support area's base amount of NUSF support.

Step 10 aggregates base support amounts across support areas to get a statewide base support amount. In step 11, each support

TABLE 2
SAM BENCHMARK CALCULATIONS

Company	Benchmark Base	Loop Cost vs. Total Cost	Access Lines Per Household	SLC Adder	Access Adder	Zone Adder	xDSL Adder	SAM Benchmark
ALLTEL	$17.50	86.00%	1.15	$0.27	$0.00	$4.96	$1.60	$25.16
Arapahoe	$17.50	86.00%	1.15	$27.60	$5.75	$6.50	$1.60	$64.98
Benkelman	$17.50	86.00%	1.15	$7.24	$0.00	$6.50	$1.60	$34.95
Cambridge	$17.50	86.00%	1.15	$10.57	$0.00	$6.50	$1.60	$38.78
Citizens	$17.50	86.00%	1.15	$5.47	$0.00	$6.50	$1.60	$32.91
Clarks	$17.50	86.00%	1.15	$17.68	$0.00	$6.50	$1.60	$46.96
Cons Telco	$17.50	86.00%	1.15	$21.47	$4.00	$6.50	$1.60	$55.91
Cons Tele	$17.50	86.00%	1.15	$18.75	$4.00	$6.50	$1.60	$52.79
Cons Telecom	$17.50	86.00%	1.15	$10.98	$4.00	$6.50	$1.60	$43.85
Cozad	$17.50	86.00%	1.15	$6.74	$0.00	$6.50	$1.60	$34.37
Curtis	$17.50	86.00%	1.15	$11.37	$0.00	$6.50	$1.60	$39.70
Dalton	$17.50	86.00%	1.15	$14.08	$0.00	$6.50	$1.60	$42.82
Diller	$17.50	86.00%	1.15	$13.15	$0.00	$6.50	$1.60	$41.75
Elsie	$17.50	86.00%	1.15	$13.89	$0.00	$6.50	$1.60	$42.60
Glenwood	$17.50	86.00%	1.15	$9.93	$0.00	$6.50	$1.60	$38.05
Great Plains	$17.50	86.00%	1.15	$6.08	$5.75	$6.50	$1.60	$40.23
Hamilton	$17.50	86.00%	1.15	$5.94	$0.00	$6.50	$1.60	$33.46
Hartington	$17.50	86.00%	1.15	$6.96	$0.00	$6.50	$1.60	$34.62
Hartman	$17.50	86.00%	1.15	$20.19	$0.00	$6.50	$1.60	$49.84
Hemingford	$17.50	86.00%	1.15	$5.30	$0.00	$6.50	$1.60	$32.72
Hershey	$17.50	86.00%	1.15	$9.93	$0.00	$6.50	$1.60	$38.04
Hooper	$17.50	86.00%	1.15	$14.49	$0.00	$6.50	$1.60	$43.29
Huntel	$17.50	86.00%	1.15	$5.81	$0.00	$6.50	$1.60	$33.30
K&M	$17.50	86.00%	1.15	$9.61	$0.00	$6.50	$1.60	$37.67
Keystone	$17.50	86.00%	1.15	$9.39	$0.00	$6.50	$1.60	$37.42
Mainstay	$17.50	86.00%	1.15	$9.95	$0.00	$6.50	$1.60	$38.06
Neb Central	$17.50	86.00%	1.15	$10.16	$5.75	$6.50	$1.60	$44.92
NEBCOM	$17.50	86.00%	1.15	$10.37	$0.00	$6.50	$1.60	$38.54
Northeast	$17.50	86.00%	1.15	$16.88	$0.00	$6.50	$1.60	$46.04
Pierce	$17.50	86.00%	1.15	$8.34	$0.00	$6.50	$1.60	$36.22
Plainview	$17.50	86.00%	1.15	$10.19	$0.00	$6.50	$1.60	$38.34
Qwest	$17.50	86.00%	1.15	$0.00	$5.75	$5.07	$1.60	$31.59
Sodtown	$17.50	86.00%	1.15	$5.69	$0.00	$6.50	$1.60	$33.16
Southeast	$17.50	86.00%	1.15	$4.34	$0.00	$6.50	$1.60	$31.62
Sprint	$17.50	86.00%	1.15	$1.90	$0.00	$4.76	$1.60	$26.80
Stanton	$17.50	86.00%	1.15	$8.04	$0.00	$6.50	$1.60	$35.87
Three River	$17.50	86.00%	1.15	$14.42	$0.00	$6.50	$1.60	$43.20
Wauneta	$17.50	86.00%	1.15	$41.74	$0.00	$6.50	$1.60	$74.63

Source: Author's construct

TABLE 3
SAM SUPPORT AMOUNTS

Company	SAM Support Amounts	Company	SAM Support Amounts
ALLTEL	17.15%	Hartman	0.45%
Arapahoe	1.24%	Hemingford	0.74%
Huntel	2.04%	Hershey	0.22%
Benkelman	0.71%	Hooper	0.25%
Blair	0.00%	K&M	0.73%
Cambridge	0.52%	Keystone	0.70%
Citizens	7.53%	Mainstay	0.15%
Clarks	0.41%	Neb Central	4.45%
Cons Telco	1.30%	NEBCOM	1.42%
Cons Tele	3.36%	Northeast	1.88%
Cons Telecom	1.07%	Pierce	0.50%
Cozad	0.33%	Plainview	0.36%
Curtis	0.49%	Qwest	21.39%
Dalton	1.24%	Rock	0.00%
Diller	0.54%	Sodtown	0.11%
Eastern	0.00%	Southeast	0.78%
Elsie	0.22%	Sprint	5.90%
Glenwood	1.60%	Stanton	0.32%
Great Plains	17.01%	Three River	1.26%
Hamilton	0.97%	Wauneta	0.42%
Hartington	0.25%		

Source: Author's construct.

area's base support amount is compared to the statewide base to determine each support area's relative allocation of the NUSF. For example, if a support area had a base support amount of $1,000 and the statewide base support amount was $100,000 then that support area would receive one percent of the state's NUSF.

In the final step, support area allocations are aggregated to the company level. Company-level final allocations are listed in Table 3.

Results

The purpose of the NUSF is to ensure that all Nebraskans, without regard to their location, including those in rural and high-cost areas, have comparable access to telecommunications services at affordable prices.[27]

SAM salient statistics indicate that more than 98 percent of NUSF support is allocated to support areas with fewer than seven (7) households per square mile, and nearly 100 percent of NUSF support is allocated to support areas with fewer than thirteen (13) households per square mile. These results are shown in Table 4. Further, nearly 100 percent of support is allocated to rural, "out-of-town," support areas.

The SAM meets the objectives of the NUSF by establishing a specific and predictable support mechanism to further provide for just, affordable, and reasonably comparable rates throughout the state of Nebraska. Further, the SAM affords the NPSC the ability to adjust the surcharge, as necessary, without affecting an NETC's relative allocation of the NUSF, and it ensures that the surcharge does not burden telecommunications consumers. Finally, as demonstrated in Table 4, the SAM focuses support to customers located

TABLE 4
PERCENTAGE OF CUMULATIVE NUSF ALLOCATED AMOUNTS BY HOUSEHOLD DENSITY

Household Density (households/square mile)	Out-of-Town Support Areas	In-Town Support Areas	Total
0-1	45.48	0.00	45.48
<2	75.12	0.00	75.12
<3	93.75	0.00	93.75
<4	96.06	0.00	96.06
<5	97.56	0.00	97.56
<6	97.98	0.00	97.98
<7	98.25	0.01	98.26
<8	98.67	0.01	98.68
<9	99.25	0.01	99.26
<10	99.47	0.01	99.48
<11	99.51	0.01	99.52
<12	99.51	0.01	99.52
<13	99.96	0.01	99.97

Source: Author's construct.

in the highest cost, lowest density, areas of Nebraska.

Conclusion

ILECs are no longer able to operate under the regulated monopoly conditions of the past. Universal service obligations must now be met through an explicit mechanism, rather than the implicit subsidies of yesterday. The NUSF was created to meet those obligations.

The SAM mechanism described herein fulfills the NPSC's need for a long-term universal service funding mechanism. The NUSF SAM utilizes regression techniques to link forward-looking cost to household density. It then uses this relationship to allocate NUSF support to NETC, consistent with the goals of the NUSF. The SAM is a practical and manageable mechanism that focuses support to high-cost areas of Nebraska. Additionally, the SAM can be readily applied to other states as it utilizes widely available data. The SAM is a useful means for Nebraska and other states to reasonably implement a universal service support mechanism.

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Notes

[1] 47 C.F.R. §§ 51.503 and 51.505 (2003).

[2] The average cost of a local loop in an exchange can be estimated using a forward-looking cost model. Forward-looking, or economic cost is a theoretical measure of cost based on the theories and practices of economics and the industry in question and is useful in analyzing the complexities and variables of a competitive environment. Forward-looking cost is not subject to the inefficiency issues, such as goldplating and historically inefficient decision-making, of some other cost measures. Rather, a forward-looking method employs current engineering practices, generally available data, and the most efficient technology available, to develop an independently verifiable measure of cost.

[3] Neb. Admin. Code Title 291 Chapter 10 Section 004.01A (2002). Only carriers explicitly designated by the NPSC, as Nebraska Eligible Telecommunications Carriers (NETCs), are eligible to receive Nebraska Universal Service Fund (NUSF) funding.

[4] See Nebraska Public Service Commission (NPSC) (April 23, 2002) for the Benchmark Cost Proxy Model (BCPM) results which were obtained in a manner identical to those used in Application No. C-2516.

[5] See NPSC (May 22, 1998, para. 8). The BCPM is a long-run forward-looking economic cost model that does not impede the provision of advanced services. It utilizes a reasonable method to build plant, reflects costs an efficient company would incur in providing facilities, uses the latest and least-cost technologies, designs plant to serve customers efficiently at their existing locations, and employs a scorched node, total element long run incremental cost (TELRIC), forward-looking, state-specific design to determine loop investment. Further, the NPSC found that the BCPM complies with the TELRIC principles adopted by the Federal Communications Commission (FCC) in its First Report and Order on Interconnection (see FCC 96-325). Additionally, the BCPM allows for analysis at a company-specific density-zone level. Consequently, the BCPM, and the Support Allocation Methodology will lead to more reliable results when allocating the NUSF. See NPSC (April 23, 2002, para. 70).

[6] An advantage of using the BCPM model is that it reports output on a density zone level.

[7] Note that not all NETCs have investment in all zones. Small NETCs, for example, may have all of their customers in some of the least dense zones and no customers in the densest zones. In contrast, the state's largest NETCs may have customers in all density zones.

[8] These classes include: DLC/DS1s; aerial, underground and buried copper; aerial, underground and buried fiber; and poles.

[9] Support equipment classes include motor vehicles, special purpose vehicles, garage work equipment, other work equipment, furniture, office and general-purpose computers.

[10] Based on BCPM results, approximately 86 percent of the cost associated with connecting users to the public switched network is attributable to the local loop.

[11] See Greene (2003) for a discussion of least squares estimation, the properties of least squares estimators and potential estimation problems.

[12] Unbiasedness of the coefficient estimates of a parameter means that the expected value of the estimate as shown in Equations (6), (7) and (8)—equals the true value of the parameter.

[13] Biased variances indicate standard techniques cannot be used to test the statistical significance of the coefficient estimates.

[14] See White (1980).

[15] See Greene (2003) for a discussion of log likelihood.

[16] See, for example, Frost and Rosenbaum (2004).

[17] See U.S. Census Bureau, (Aug. 13, 2004), http://www.census.gov/population/www/cps/cpsdef.html.

[18] See NPSC (Jan. 13, 1999, para. 6).

[19] Neb. Rev. Stat. §§ 86-316 to 86-329 (2003).

[20] Based on BCPM results.

[21] See NPSC (2001), for the total number of Nebraska residential access lines is from. See the U.S. Census Bureau (2000), for the number of Nebraska households. See the FCC (May 2004, para. 8), for the percentage of Nebraska households with telephone service.

[22] See NPSC (Jan. 1999), 2-3.

[23] The Access Adder-Adjustment is company-specific. For each company, it is based on access revenues the company actually earned relative to the revenues it would have earned had it charged the lowest access rate in the state. More specifically, it is calculated as average annual access revenue in excess of annual access revenues that would have been earned had the lowest Nebraska average access rate been charged, stated as a monthly, per-line, amount.

[24] See FCC (Oct. 30, 1998). The FCC previously determined DSL to be an interstate service properly tariffed at the federal level. See para. 1.

[25] Associated Press (Aug. 13, 2004), http://www.ntaonline.net/news/2004/broadband18mar2004.htm.

[26] The product of the values; availability, penetration, and contribution, (0.80*0.20*$10) = $1.60.

[27] Neb. Rev. Stat. §§ 86-317 and 86-323 (2003).